

VII. Scientific Equipment

Section VII lists the principal scientific equipment available at McMurdo, South Pole, and Palmer stations and onboard USAP research vessels.

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Astrophysics/ Aeronomy						
Analyzer, Logic		X				
Antenna, VLF Loop	X	X	X			X
Camera, All-Sky	X	X				X
Camera, Video, Towed Benthic, SCUDIVA				X	X	
Chart Recorder, Eight Channel		X				
Cryogen, Transfer Equipment	X	X	X	X	X	
Cryogen Transfer Lines	X	X				
Dewar, Liquid Helium	X	X				
Dewar, Liquid Helium Storage	X	X				
Dewar, Liquid Nitrogen Storage	X	X	X	X	X	
Dewar, Liquid Nitrogen Storage, 160 liter	X	X	X	X	X	
Filtration Apparatus, Membrane	X			X	X	
Heating Unit, Air		X				
Hi-Vacuum System		X		X	X	
Ice Maker	X	X	X	X	X	
Incubator, Percival -Move to Biology		X	X	X	X	
Interferometer		X				
Ionosonde, Digital		X				
Laboratory, Portable (Radiation) –Move to Biology section				X	X	

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Leak Detection and Vacuum Pump Equipment	X	X				
Lidar	X	X				
Line Connector, 1.2 KVA		X				
Liquid Nitrogen Plant	X	X			X	
Magnetometer, Three Component Air Core Induction		X				
Magnetometer, Three Axis Fluxgate	X	X				
Neutron Monitor, Super Multisection	X					
Nitrogen Liquifier	X	X				
Oscilloscope	X	X		X	X	
Oxygen-Analyzing System		X	X	X	X	
Photometer, Auroral	X	X				X
Pipette Puller	X					
Power Conditioner	X	X		X	X	
Pump, Turbomolecular	X	X			X	
Radiotelescope, Microwave		X				
Receiving System, VLF		X	X			
Riometers, 30 & 50 MHz	X	X				X
Scintillator Array, 16-element		X				
Sky Monitor, Mid Infrared		X				
Sky Monitor, Near Infrared		X				
Signal Generator		X				
Spectral Analyzer		X				
Spectrometer, X-ray (high altitude, long-duration)		X				
Spectrometer, Infrared		X				
Spectroradiometer, Ultraviolet	X	X	X			
Tape Transport, Dual Density		X				
Tape Drive, Giga Tape 5 Mb		X				

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Telescope, 12" (Optical)		X				
Telescope, Gamma Ray						
Telescope, Microwave		X				
Telescope, Mid-Infrared		X				
Telescope, NCAR Infrared						
Telescope, Optical		X				
Telescope, Submillimeter		X				
Telescopes, Astronomical		X				
Thermal Electric Generator (TEG)						X
Time Domain Reflectometer (TDR)		X			X	
Transport, Liquid Helium (leased)		X				
Transport, Liquid Nitrogen		X				
Uninterrupted Power Supply (UPS)	X	X	X	X	X	
Water Chiller		X				

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Biology						
Aquaria	X		X	X	X	
Analyzer, Carbon/Nitrogen/Sulfur	X		X			
Analyzer, Infrared, Carbon Dioxide	X					
Analyzer, Infrared, Hydrocarbon	X					
Analyzer, Lactate	X					
Analyzer, Total Organic Carbon	X		X			
Autoanalyzer - Nutrient	X		X	X	X	
Autoclave	X	X	X	X	X	
Balance, Electronic	X	X	X	X	X	
Bath, Hybridization	X					
Bath, Water	X	X	X	X	X	

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Bath, Water, Circulating	X		X	X	X	
Bath, Water, Shaking	X		X	X	X	
Calorimeter			X			
Camera, Digital Still	X	X	X	X	X	
Camera, Solid State, for Microscopic Image Analysis	X		X	X	X	
Camera, Still, Underwater	X			X	X	
Camera, Video, for Microscopy	X		X	X	X	
Camera, Video, Underwater, w/time lapse capability and remote viewing	X		X	X		
Cell Disrupter	X		X	X		
Cell Injector, Micro	X					
Centrifuge, Clinical	X		X	X	X	
Centrifuge, 20K RPM	X		X	X		
Centrifuge, Refrigerated Speed Vac	X		X			
Centrifuge, Refrigerator				X	X	
Chart Recorder, Single Channel	X		X			
Chart Recorder, Dual Channel	X		X			
Chart Recorder, Three Channel	X		X			
Chiller, Aquarium	X		X			
Chromatography Equipment	X		X			
Chromatography, High Performance Liquid System (HPLC)	X		X	X		
Chromatography, Gas, System	X		X		X	
Chromatography, Ion, System	X					
Collector, Fraction	X		X			
Colorimeter	X		X			
Compressor, Air, Scuba Tank	X		X	X	X	
Cooler, Immersion	X		X	X	X	
Counter, Gamma	X					

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Counter, Geiger Muller	X		X	X	X	
Counter, Particle	X					
Counter, Liquid Scintillation, DPM Output	X		X	X	X	
Cryostat	X	X				
Data Acquisition System	X	X	X	X	X	
Datalogger	X		X	X	X	
Deck Unit/Transducer	X		X	X	X	
Detector, Column Absorbance	X					
Dewar, Liquid Nitrogen Storage	X	X	X	X	X	
Dive Propulsion Systems	X					
Dry Shippers, Liquid Nitrogen	X	X	X	X	X	
Electrocardiograph	X	X				
Electrophoresis Equipment	X		X	X		
Electroporator	X					
Environmental Room, Temp. Controlled	X		X	X	X	
Evaporator, Rotary	X		X			
Filtration Apparatus, Water	X		X	X	X	
Filtration Apparatus, Membrane	X		X			
Fluorometer	X		X	X	X	
Fluorometer, DNA	X					
Freeze Dryer	X		X			
Freezer, to -20°C	X	X	X	X	X	
Freezer, to -70°C	X		X	X	X	
Freezer, Walk-in	X				X	
Furnace, Graphite	X					
Furnace, Muffle	X		X	X	X	
Gas Partitioner	X					
Hematology Equipment	X	X	X			
Hi-Vacuum System	X	X				

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Homogenizer	X		X	X		
Hood, Fume	X		X	X	X	
Hood, Portable Fume Absorber			X		X	
Ice Maker	X	X	X	X	X	
Ice Maker (dry ice)	X	X	X		X	
Incubator,Hybridization	X					
Incubator, Low Temperature Lighted	X		X	X	X	
Laboratory, Portable (for sea ice)	X			X		
Laminar Flow Bench	X		X	X	X	
Light Pipette	X					
Lipid Analysis System	X					
Luminometer			X			
Melter, Ice Hole	X				X	
Meter, Microoxygen	X		X			
Meter, Oxygen	X	X	X			
Meter, pH	X	X	X	X	X	
Microbalance	X		X			
Centrifuge, Micro	X		X	X	X	
Microscope, Compound, Epifluorescence	X		X	X	X	
Microscope, Compound (for light/dark field microscopy)	X	X	X	X	X	
Evap Microscope, Cold Stage	X					
Microscope, Differential Interference Contrast (DIC)	X		X	X	X	
Microscope, Dissecting (for light/dark field microscopy)	X	X	X	X	X	
Microscope, Compound (for phase contrast microscopy)	X		X	X	X	
Microscope, Image Analysis System	X		X	X	X	
Microscope, Inverted, Epifluorescence	X		X			

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Microplate Reader	X					
Microtome	X					
Microtome, Cryostat	X					
Oscillograph, Recording, Thermal, 8 Channel	X					
Oscilloscope	X	X	X	X	X	
Osmometer, Vapor Pressure	X		X			
Oven	X	X	X	X	X	
Oxidizer, Biological	X					
Oxygen-Analyzing System	X			X	X	
Photometer, Integrating (for ATP)	X					
Photometer, Flame	X					
Photosynthesis System	X		X			
Phototrans illuminator	X		X	X		
Plotters, Thermal				X	X	
Processor, Tissue	X		X			
Projector, Digital	X		X	X	X	
Pump, Suction		X	X	X	X	
Pump, Vacuum	X	X	X	X	X	
Receiver, ATS	X		X			
Receiver, VHF Radio	X		X	X	X	
Refrigerator, Explosion Proof	X		X	X	X	
Respirometer, Gilson	X		X			
Scale, Platform, Sled Mountable	X					
Sediment Trap	X					
Sensor, Irradiance (for dry use)	X		X	X	X	
Sensor, Irradiance (for submersible use)	X		X	X	X	
Sequencing System	X				X	
Spectrophotometer, Atomic Absorption	X					
Spectrophotofluorometer	X		X	X	X	

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Spectrophotometer	X		X	X	X	
Spectrophotometer, Diode Array	X		X	X	X	
Spectroradiometer	X		X	X	X	
Stage, Cooling, Microscope	X		X	X	X	
Thermocycler	X		X			
Thermocycler, PCR	X		X	X	X	
Thermometer, Digital	X		X	X	X	
Transponder Reader	X					
Ultracentrifuge	X		X			
Ultrafiltration Unit	X		X	X		
UV Sensor, Portable	X					
VCR, High Resolution	X		X			
Vibration-free table	X		X	X	X	
Video System, Underwater	X		X	X	X	
Voltage Clamp	X					
Water Purification System	X	X	X	X	X	
Workstation, PICO Tag	X					

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Computers						
<u>MacIntosh:</u>						
Laptop	X	X	X	X	X	
Desktop	X	X	X	X	X	
<u>PC:</u>						
Desktop	X	X	X	X	X	
Laptop	X	X	X	X	X	
<u>Workstation:</u>						
HP 9000			X			

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
SGI 02					X	
SGI Challenge L (Multibeam computers)					X	
SGI Iris					X	
SPARC IPX	X	X				
Sun SPARC 10	X		X			
Sun U450	X					
Sun Ultra1	X					
Sun Ultra2	X					
Sun SPARC 2	X	X	X		X	
SGI Indy				X	X	
<u>Printers</u>						
Dot Matrix	X	X	X	X	X	
Dye Sublimation, Color	X				X	
Ink Jet, Color	X	X	X	X	X	
Laser	X	X	X	X	X	
<u>Miscellaneous</u>						
CDRom - R	X	X	X	X	X	
CD Writer	X	X	X			
Magneto-optical Drive	X				X	
Digitizer	X					
Plotter, Ink Jet, Monochrome	X			X	X	
Plotter, Pen, Color	X	X	X		X	
Zip Drive	X	X	X	X	X	

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Environmental Monitoring						
Acoustic Release	X			X	X	
Analyzer, CO	X				X	
Analyzer, NOx	X					
Analyzer, Pesticide/PUF	X					
Analyzer, SO ₂	X					
Calibration System, Multigas	X					
Concentrator, Turbo-Vap II	X					
Current Meter	X			X	X	
Deck unit/Transducer	X			X	X	
Sampler, Air, Hi-Vol.	X	X				
Toxicity Analyzer	X					
Water Quality Logging System	X					
Water Quality System	X		X			

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Geology/Geophysics						
Ball Mill	X		X			
Chronology Clock				X	X	
Data Translation D/A Converters				X	X	
Diamond Drill and Associated Equipment	X					
Echo Sounder, Bathy 2000 "chirp" sub-bottom profiler					X	
Echo Sounder, Knudsen, Sub-bottom Profiler				X	X	
Echo Sounder, Simrad EK500					X	
Gravimeter, Portable					X	
Gravimeter, Air-Sea					X	

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Heliocoder	X	X				
Jack Hammer	X		X			
Jumbo Piston Corer					X	
Kasten Corer				X	X	
Microscope, Electronic Stage w/point counter	X					
Microscope, Polarizing with Camera	X					
Microscopes, Petrographic	X	X	X	X	X	
Rock Saws	X					
Rock Polisher, Automatic	X					
Seismic, Benthos, Single Channel					X	
Seismic Bolt, Long-Life Array, 6 guns, 3000 cubic inches total					X	
Seismic, G/I air-guns (210 cu in)					X	
Seismic, G/I water-gun (25 cu in)					X	
Seismic, ITI multi-channel streamer (48 channel, 25m group interval)					X	
Seismic, ITI single channel streamer					X	
Survey System, GPS	X	X	X	X	X	
Swath bathymetric mapping system					X	
Thin-Section Machine	X			X		
Time Standard		X	X		X	

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Geomagnetism						
Antennas, Dipole		X		X	X	
Gradiometer, Magnetic--towed					X	
Magnetometer, Portable	X	X				
Magnetometer, Quartz, Horizontal		X				

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Magnetometer, Standard Induction		X				
Magnetometer, Towed					X	
Magnetograph, Three-component, Standard, Low Sensitivity		X				
Magnetograph, Three-component, Rapid Run, Low Sensitivity		X				
Magnetometer, Visible Recording		X	X			
Time Standard		X			X	

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Glaciology						
Drill, Jiffy w/ Power Head	X		X	X	X	
Drill, Shallow (100 meters)	X					
Drill, Ice Coring, Intermediate (500-1000m)	X					
Generator, Shear Wave	X					
Geoceivers	X	X				
Ice Auger, SIPRE	X	X	X			
Rigsby Stage	X					

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Meteorology						
Barometers	X	X	X	X	X	X
Data Loggers	X	X	X	X	X	
Detectors, Aerosol and CN (balloon-borne)		X				
Laser Ceilometer		X	X			
Precipitation Gauges	X		X			
Pressure Indicators	X	X	X			
Pygeometers	X			X	X	
Pyranometer	X		X	X	X	
Receiver, High Resolution Picture (Terascan)	X		X		X	
Recorder, Four-Channel	X	X				
Satellite Receiving Data Manipulation System	X		X		X	
Set of Pyranometers, Tyrhelometers and Net Radiometers		X		X	X	
Temperature Probe Aspirators, Qualimetrics/Weather Measure		X				
Temperature Probes, RTD-Platinum	X	X	X	X	X	
Temperature Thermometers	X	X	X	X	X	X
Transmitters, PTT	X		X			
Weather Station	X	X	X			X
Weather Stations, Automatic	X	X	X			
Weather System			X	X	X	
Wind System and Recorder with Transmitter	X		X	X	X	
Wind Anemometers	X	X	X	X	X	
Wind Indicators	X	X	X	X	X	X
Wind Translators		X		X	X	

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG¹</u>	<u>NBP²</u>	<u>AGO³</u>
Oceanography/Limnology						
A-Frame				X	X	
Acoustic Doppler Current Profiler				X	X	
Acoustic Release with Surface Command Unit	X			X	X	
Nutrient Analyzer	X		X	X	X	
Conductivity Temperature Depth Instrument (CTD)	X		X	X	X	
Current Meter, Electromagnetic	X					
Data Acquisition System	X		X	X	X	
Deep Sea Coring System				X	X	
Depth Finder	X		X	X	X	
Echo Sounder, Biosonics Acoustic Profiler			X	X		
Fluorometer, Fast Repetition-Rate			X	X		
Fluorometer, Flow-through				X	X	
Go-Flo Bottles	X		X	X		
Hood Laminar Flow, Portable			X	X	X	
Hydraulic Boom				X	X	
Hydrodavit				X	X	
Inflatable Boat, Zodiac			X	X	X	
Isotope Van			X	X	X	
Laboratory Van				X	X	
Garage/Clean Laboratory Van				X		
Launcher, XBT				X	X	
Liquid Helium Vapor Recovery System		X				
Messenger	X		X	X	X	
Metering Sheave	X		X	X	X	
Niskin Bottle	X		X	X	X	
PCO ₂ Instrument				X	X	

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG</u> ¹	<u>NBP</u> ²	<u>AGO</u> ³
Plankton Net	X		X	X	X	
Pressure Transducer	X			X	X	
Radar				X	X	
Rosette				X	X	
Salinometer	X		X	X	X	
SAT P-Code GPS				X	X	
Sediment Trap	X			X		
Sonar, Side Scan				X	X	
Thermosalinograph				X	X	
Transmissometer			X	X	X	
Trawl Gear				X	X	
Winch, Deep Sea Trawl				X	X	
Winch, Hydrographic				X	X	
Winch, Portable, Electric	X		X	X	X	
Winch, Portable, Gasoline	X		X			
Winch, Portable Hand			X			

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG</u> ¹	<u>NBP</u> ²	<u>AGO</u> ³
Seismology						
Gravimeter		X				
Gravimeter, Lacoste & Romberg (Marine)					X	
IRIS System		X	X			X
Receiver, GPS	X	X	X	X	X	X
Seismograph	X	X	X		X	

	<u>McMurdo</u>	<u>SPole</u>	<u>Palmer</u>	<u>LMG</u> ¹	<u>NBP</u> ²	<u>AGO</u> ³
Other						
Cryogen Vaporizer	X	X				
Data Link, Satellite	X	X	X	X	X	X
Drill Press	X	X	X	X	X	
Frequency Counter	X		X	X	X	
Global Positioning System	X	X	X	X	X	X
Handheld Global Positioning System	X	X	X	X	X	
Lathe	X	X	X	X	X	
LOX Transport	X					
Maritime Fixed Station (INMARSAT)	X		X	X	X	
Meter, Multi	X	X	X	X	X	
Meter, RCL	X				X	
Mill		X				
Milling Machine, Vertical		X				
Nitrogen Generator	X	X				
Projector, Video	X	X	X	X	X	
Resistors and Capacitors, Decade	X		X	X	X	
Scanner	X	X	X	X	X	
Tracking System, Satellite	X	X	X			
Transceivers, Satellite, ATS-3	X	X	X			
Un-interruptible power supply (UPS)	X	X	X	X	X	
Video Camcorder	X	X	X	X	X	

1 = R/V Laurence M. Gould

2 = R/V Nathaniel B. Palmer

3 = Automated Geophysical Observatory